

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) **17 JUNE 2005 (17.06.2005)**

Applicant's or agent's file reference
SS-21261-PCT

FOR FURTHER ACTION
See paragraph 2 below

International application No.

PCT/KR2005/000357

International filing date (day/month/year)

05 FEBRUARY 2005 (05.02.2005)

Priority date (day/month/year)

17 FEBRUARY 2004 (17.02.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC7 H01L 29/78, H01L 21/335, H01L 21/336

Applicant

SAMSUNG ELECTRONICS CO., LTD. et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



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**WRITTEN OPINION OF THE
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Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-37	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-37	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-37	YES
	Claims	NONE	NO

2. Citations and explanations :

1) Reference is made to the following documents:

D1 : US 2004/0026736 A1	D2 : JP 2003-197916 A
D3 : US 6413802 B1	D4 : US 2004/0036126 A1
D5 : KR 2004-75566 A	

2) Novelty and Inventive Step

The present application is related to a semiconductor device comprising : a first active region comprising a plurality of slabs formed on a substrate, each slab having a first surface, a second surface facing a direction opposite to the first surface, and a top surface: a second active region contacting at least one end of the slabs on the substrate to connect one another; a gate line on the first surface, the second surface and the top surface of each of the slabs; and a gate dielectric layer interposed between the slabs and the gate line (claims 1-18) and a manufacturing method thereof (claims 19-37).

Each of documents mentioned in 1) discloses semiconductor devices having multi gates. But, none of the documents D1 to D5 discloses a semiconductor device in which a second active region(140a) contacting at least one end of the slabs on the substrate to connect one another is formed.

By dividing the active region into a first and a second active regions in which the second active region is formed to connect each other of the slabs, a rounding phenomenon or a 'not open' phenomenon can be avoided in this invention.

As mentioned above, it is considered that D1-D5 are to be little relevant to the semiconductor device (claims 1-18) and the manufacturing method the same (claims 19-37).

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

BOX V

Compared with the prior art as cited in the International Search Report, the present invention(claims 1-37) is believed to be novel and to involve an inventive step under PCT Article 33(2) and 33(3).

3) Industrial Applicability

And the present invention has industrial applicability under PCT Article 33(4).